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ABSTRACT

Burlington County College in New Jersey has integrated Interactive Videodisc Technology (IVT) into several of its programs, beginning with the college's nursing program. IVT, at its highest level, is a merging of a laser disc player, a personal computer, computer software, and a qualified instructor, designed to bring to students a new dimension of learning by augmenting, not replacing, classroom learning. The college's primary interactive video system is the SONY VIEW 5000, which resembles a typical personal computer, but includes a built-in laser disc player, a 100-megabyte hard disk drive, and a high resolution color touch screen monitor. Because it allows for simulations of patient care, IVT is especially appropriate to nursing education. Although the nursing program has the college's largest collection of IVT software, the technology is also used in many other programs, such as mathematics, Commercial Driver's License, remedial English classes, and the Computer Adaptive Learning Literacy Lab. The flexibility of IVT allows it to be used individually for self-paced remediation, in small groups for peer interaction, and in the classroom to illustrate an instructor's lecture. For the student, IVT provides the advantages of self-paced learning, instantaneous feedback, computer adaptive progression, and a non-threatening challenge. IVT can also lead to the active involvement of the learner, emotionally entangling simulations, and statistically significant learning outcomes. The paper includes definitions of basic terminology, a list of types of machines available, and a set of criteria for evaluating the appropriateness of IVT. (MAB)

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Burlington County College

Interactive Videodisc Technology

October 1992

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Enhancing Student Success Through the Use of Interactive Videodisc Technology

Paper presented at the Annual Computer Conference of the League for Innovation in the Community College (Orlando, FL, October 21-24, 1992).

Presented by:

Richard J. Pokrass, director of college relations and publications
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Jenifer Gajdalo, instructor of nursing
October 23, 1992

The use of interactive videodisc technology at Burlington County College was several years in the making.

The process began with a 1989 directive from college President Robert C. Messina, Jr. He designated three administrators---the director of college relations and publications (who oversees classroom A-V support), the grants administrator, and the computer center director---to research practical applications of interactive video and recommend hardware and software purchases. Subsequent research also included the nursing faculty and community services staff.

Visits to other colleges, participation in professional association meetings and numerous discussions with prospective vendors led to the purchase of two types of interactive videodisc machines which will be discussed later. During this hardware and software review process the college also conducted four on-campus interactive video workshops to acquaint interested faculty with the new technology, familiarize them with new terminology, and provide hands-on demonstrations.

Interactive videodisc technology at its highest level is a merging of a laser disc player, a personal computer, computer software, and a qualified instructor, to bring to students a new dimension of learning. Interactive video is not intended to replace classroom teaching, but rather to enhance it.

It is important to note that we have often seen the phrase "interactive video" used elsewhere to describe processes vastly different than ours.

For example, some users of satellite technology refer to live teleconferences as "interactive video," since the satellite feeds involve video and there is usually two-way audio interaction between the remote audience and the origination site. Likewise, we should differentiate between interactive video and Computer Assisted Instruction. Burlington County College, like many other colleges, uses desktop computers to enhance instruction in mathematics, writing, graphic design, electronics, and other subjects. Although there is an image on a monitor which resembles a television screen, this is not interactive video. Interactive videodisc technology could, however, be considered an advanced form of Computer Assisted Instruction.

Finally, we have heard some people who use videotapes in a start/stop mode refer to their instructional style as interactive video.

For the purposes of this presentation, we are describing the use of integrated videodisc stations, involving advanced laser disc players, microcomputers and laserdiscs with a high level of interactivity.

Some Basic Terminology

When reviewing interactive video materials you will see certain terms which, at first, might seem confusing. They will actually be easy to learn.

Videodisc- A videodisc is silver in color and is otherwise similar in appearance and size to a typical LP record. Each side of a 12-inch videodisc contains 54,000 frames or images. The videodisc is read by a laser beam, not a needle, so the disc does not scratch and is virtually indestructible. Still, you should treat discs with care since many advanced discs are very expensive.

CD-ROM- A "Compact Disc-Read Only Memory" or CD-ROM disc is not normally part of an interactive video system, but is worth mentioning here since it resembles a miniature videodisc. CD-ROM is useful in storage and retrieval of large volumes of reference material, whereas a videodisc is best used for video images.

Constant Angular Velocity (CAV)- CAV discs are capable of interactivity and freeze frame. They spin at a constant speed and are limited to approximately 30 minutes in length per side.

Constant Linear Velocity (CLV)- CLV discs change the speed of their rotation as they play. They can hold up to 60 minutes of images per side, but are not interactive. Movies which have been converted to videodisc for home or library viewing are usually in the CLV format.

Authoring Tools- Authoring Tools are computer programs which enable users of interactive video technology to customize interactive video lessons. Authoring Tool software for interactive video is normally expensive.

Types of Machines

There are presently four types of interactive video players and you must know what type you plan to use before selecting courseware. All courseware will not work on all machines.

Level I- A Level I player is usually a consumer-type laser disc player and includes such features as freeze frame, picture/chapter stop, random access to specific frames, and remote control, but limited ability to interact with a computer or user. Most movies which have been converted to laser disc are best played on a Level I machine.

Level II- A slightly advanced version of a Level I player, a Level II unit has most of the same features plus some computer controls.

Level III- The Level III player is connected to a personal computer and offers the user a high degree of interactivity. The viewer may respond to questions or activities displayed on the screen and then proceeds to subsequent sequences based on his/her responses.

Compact Disc-Interactive (CD-I)- CD-I is the newest interactive technology. The machine plays a disc which resembles in size a standard compact music disc, but the disc contains live-action video and a high degree of user interactivity without needing a computer.

BCC's Interactive Video Equipment

The primary interactive video system selected for use at Burlington County College is the SONY VIW5000. This compact unit, which closely resembles an ordinary personal computer, is a powerful learning tool which includes a built-in laser disc player, a 100-megabyte hard disc drive, and a high resolution color touch-screen monitor. Each unit is equipped with a heavy duty surge protector.

The SONY VIW5000 is fully compatible with all interactive courseware which was developed for Level III SONY and IBM InfoWindow systems. It is not presently compatible with software designed for the MacIntosh system. The SONY hardware was selected due to its size, ease of operation, and cost, as well as the wide range of available courseware.

Following competitive bidding, Burlington County College purchased its first three SONY units in Spring 1991. One is permanently assigned to the college's nursing practice lab. A second is assigned to a large group classroom and is equipped with a special video projector for use in large lecture sessions. The third unit is located in the college library for testing of demonstration videodiscs by college faculty. Fifteen additional SONY VIW systems were later purchased for use in credit-free remedial math, commercial driver and remedial English classes. During mid 1992 two more VIW systems were purchased for the nursing lab, bringing the college's total number of these units to 20.

Several other types of interactive videodisc equipment are being used at Burlington County College, but to a lesser degree than the VIW systems.

As part of its new Computer Adaptive Learning Literacy lab the college purchased two SONY LaserMax videodisc players which are connected to Dell microcomputers to form fully functional interactive videodisc systems. These machines are part of a comprehensive lab of unique computer hardware, software and miscellaneous devices designed to make computers and vocational training accessible to people with serious visual or hearing impairments.

The college also owns four Pioneer LVD2200 level I laserdisc players, which are used in biology, art, and non-credit remedial reading classes.

The most recent addition to the college's collection of interactive equipment, also residing in the new Computer Adaptive Learning Literacy lab, is a Philips Compact Disc-Interactive (CD-I) machine.

BCC Courseware

Because nursing was the first academic program to use interactive videodisc technology at Burlington County College, it is currently the program with the largest library of videodiscs. Our present titles include:

Emergency Simulation (Data Star)
Intraveneous Therapy (FITNE)
Managing the Experience of Labor and Delivery (Health Science Consortium)
Mechanical Ventilators (Data Star)
Medication Administration Module I (American Journal of Nursing)
Nursing Care of the Elderly Patient with Acute Cardiac Disorders (American Journal of Nursing)
Nursing Care of the Elderly Patient with Chronic Obstructive Pulmonary Disease (American Journal of Nursing)
The Suicidal Adolescent (National Library of Medicine)
Therapeutic Communication (FITNE)
Volumetric Infusion Pumps (SETS)

In addition to the nursing courseware, the college has purchased an extensive array of materials for other curricula.

Courseware for credit-free classes includes Interactive ModuMath and Commercial Drivers License (CDL) Accelerator.

The college's hospitality management program uses three videodisc programs produced by the Educational Institute of the American Hotel-Motel Association: Dining Room Services, Guest Relations, and Front Office Techniques. The hospitality software is used in an independent study mode. The college's food service employees also use this software to enhance their customer service skills.

Level I art courseware includes The National Gallery of Art and Masterpieces of the Met. This software will be used to acquaint students with the collections of both museums before they embark on field trips to the museums.

During the 1992 Fall semester the college began using the Optical Data Corporation's level I Living Textbook program to enhance lectures and lab sessions in introductory biology classes.

Level I programs featuring Cicely Tyson and Bill Cosby are used for basic reading courses in the college's non-credit Adult Basic Education program.

Interactive videodisc programs purchased for the new Career Adaptive Learning Literacy lab include the SETS Learning Style Survey, Attributes for Successful Employment, The Name Game, Making the Telephone Work for You, Job Interview Skills, Effective Study Skills, SETS Introduction to Personal Computers, Microsoft Word Training, Lotus 123 Training, MS/PC DOS Training, Introduction to Economics, The Receptionist, and Future Focus.

The Use of Interactive Video for Nursing Education

The student population at Burlington County College is highly diverse. No doubt this is characteristic of your academic institution as well. The student population ranges in age from 17 years through the 7th decade. Cognitive abilities are quite varied: some students are in need of extensive remediation when they first enroll; others come to us with bachelor's and master's degrees. Many of these degrees are obtained in foreign countries. Although students are not evaluated as to specific learning styles, it is immediately apparent that there are multiple learning styles operating in the learning setting. Because of this diversity, interactive video is an ideal teaching/learning tool.

Because interactive videodisc technology combines the processing power of the microcomputer with videodisc technology, there is rapid access of information in both visual and auditory form along with ongoing feedback. Interactive videodisc technology provides for accurate presentation of information along with consistency of information presentation among students. The technology allows for process focussed learning.

Interactive videodisc simulation is especially appropriate for nursing education. Level III interactive video allows for accurate portrayal of the contextual aspects of patient care situations. Research in nursing education over the past 20 years concerning clinical judgment and decision making in nursing has consistently demonstrated that situational and contextual clues are paramount in developing clinical expertise.

In addition, through the use of Level III interactive videodisc simulations each student is exposed to the same "patient". Students are able to observe the consequences of decisions they make without a real-live patient being exposed to any risk. It has been noted that students are more apt to explore options rather than "playing it safe" in this modality. Finally, it is worth pointing out that the national RN licensure examination (NCLEX-RN) was piloted during February, 1991, on interactive videodisc utilizing simulated computer testing.

Pedagogically, there are several ways to employ interactive video in the instructional design. We have implemented this technology on an individual basis, in small groups with or without an instructor, and with large groups in the classroom with large screen projection.

Research involving interactive videodisc programs is in its infancy. Reasons for this include lack of available software and lack of widespread dissemination of hardware. Individual use of interactive video programs has been statistically demonstrated to be as effective as other methods of teaching. The advantage of individual use of interactive video lies in the accuracy, consistency, and replicability experienced by each and every student in the learning situation. Additionally, the computer is immensely patient with the slower learner. Limited research findings indicate that use of interactive video with small groups of 2-4 is more effective than the lecture method of teaching. Minimal research is currently available to discuss the effectiveness of classroom use of this modality.

Interactive videodisc software can be used **individually**. In order to complete written clinical assignments students often elect to remediate on their own. A prime example is our interactive video program on Therapeutic Communication. Many students avail themselves of the tutorial aspect of this technology. It is available in the campus library as well as the interactive video lab. The library is open seven days a week, including daytime and evening hours, Mondays through Fridays.

Interactive videodisc simulation is equally effective when used with **small groups**. At our community college we have noted students working in groups of 2-4 in the nursing arts lab with the interactive videodisc. Our nursing lab contains equipment which allows the student to immediately apply the information being presented. For example, students go to the lab during open lab hours to work with the Intravenous Therapy disc. Throughout the simulation students pause to manipulate intravenous catheters, tubing, and solutions. Small group members direct and correct each other from information presented on the screen.

At BCC we have also incorporated interactive videodisc simulation into the **classroom**. For example, following a presentation of didactic material, a panel of three students is selected to make clinical decisions as the interactive videodisc simulation unfolds. Consequences of the panel's decisions are immediately apparent on the large screen. As these consequences are viewed, the entire class offers comments regarding the appropriateness of the panel's decisions.

Because many of the interactive videodisc programs have multiple segments, many students from the class have the opportunity to serve as panel members within one simulation. As differences of opinion emerge, panel members have the option of "taking control" of the simulation, returning to the Main Menu, and selecting the library function. The library function allows the panel members to access related information on the screen in order to support or alter their decision. As classroom discussions ensue, students are exposed to the multiplicity of possible decisions a large group can generate.

Another feature that we have implemented is the on-screen remote. Although most software manufacturers have not anticipated end-users utilizing programs in this way, we have found this feature invaluable. We easily access the on-screen remote by typing the word "remote" at the c-prompt after inserting the appropriate videodisc into the video player. The on-screen remote allows us to access any one of the 54,000 videoframes on the disc. After locating the desired frame, we then play the video segment of our choosing. If we are unsure of the frame number desired, we can quickly scan or fast-forward through the disc until we locate the appropriate scenario. Software manufacturers are beginning to recognize the value of identifying specific segments of the program by frame number. This facilitates an even wider range of uses for any given software program.

With the introduction of any new instructional tool there are advantages and disadvantages. Advantages can be categorized as those which are instructional and those which directly benefit the student. Student advantages include self-paced learning, instantaneous feedback, computer adaptive progression, and challenging without threatening. Among instructional benefits are: active involvement of the learner; emotionally entangling simulations; and statistically significant learning outcomes among students.

Disadvantages center around the hardware, software, and instructor comfort level.

Is Interactive Video Appropriate for My Classes?

Because interactive video hardware and software can be expensive, you should ask yourself a few vital questions before pursuing the use of this technology:

1. Is your course enrollment large enough to warrant such an investment?
2. Is your course material visual in nature?
3. Is there something that would be better demonstrated on disc than in a live setting?
4. Does the course content include extensive variations which can best be demomstrated on disc?
5. Is the course content relatively stable and used each semester?
6. Is courseware presently available in the desired subject area? Interactive video is relatively new, and not all academic areas can take advantage until a greater variety of courseware comes on the market.

Future Plans

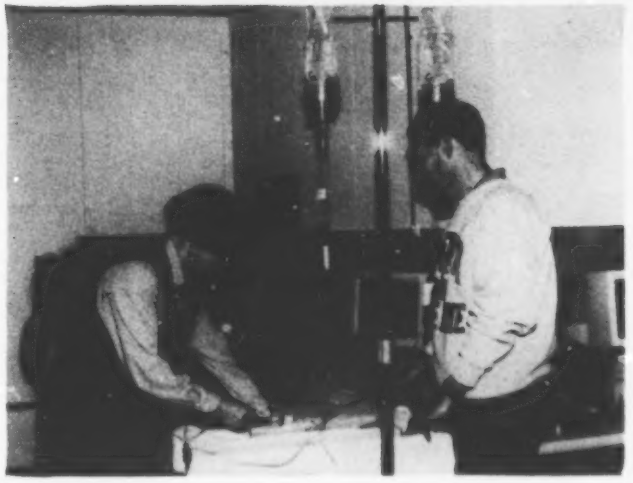
Burlington County College will continue to expand its use of interactive video in the coming year with the purchase of hardware and courseware for additional academic programs.

For additional information, please contact Richard J. Pokrass, director of college relations and publications, at (609) 894-9311, extension 331 or 332 or Dr. Colleen Glavin-Spiehs, (609) 894-9311, extension 408.

INTERACTIVE VIDEODISC TECHNOLOGY

at BURLINGTON COUNTY COLLEGE

Students in the campus nursing lab participate in interactive videodisc patient care simulations before beginning their clinical internships in local hospitals.



20-station lab at BCC's Willingboro branch serves students in basic math, basic reading, and workplace literacy courses.

Using headsets, students can work side-by-side on different interactive video software programs.

Demonstration unit in the college library enables faculty members in various disciplines to experiment with videodisc courseware.

Interactive videodisc technology is used in a large group setting as the image from the SONY View 5000 system is projected onto a 100-inch screen built by the college maintenance department.

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Sources of Additional Information
About
Interactive Videodisc Hardware and Software

Intellimation Library for the Macintosh
Department XA
130 Cremona Drive
P.O. Box 1922
Santa Barbara, CA 93116-1922

Interact Journal
International Interactive
Communications Society
College of Communication
California State University
Chico, CA 95929-0504

Multimedia and Videodisc Monitor
P.O. Box 26
Falls Church, VA 22040-0026

SONY View System Solutions and Resource Guide for Interactive Video
Intelligent Systems Division
SONY Drive
Park Ridge, NJ 07656

T.H.E. Journal (Technological Horizons in Education)
150 El Camino Real, Suite 112
Tustin, CA 92680-3615

Technology and Learning
Peter Li Publications, Inc.
2451 East River Road
Dayton, OH 45439

Videodiscovery Educational Videodisc Catalog
William C. Brown Publishers
2460 Kerper Boulevard
Dubuque, IA 52001

Wisconsin Foundation for Vocational, Technical and Adult Education
2564 Branch Street
Middleton, WI 53562

Ztek Company
P.O. Box 1055
Louisville, KY 40201-1055